

MONTHLY NOTICES

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PROFESSOR CAYLEY, F.R.S., President, in the Chair.

John Berger Spence, Esq., Erlington Hall, Manchester ;

Dr. Robert Brown, Birkenhead College ;

Prof. W. K. Clifford, M.A., University College, London ;

Josh. Hough, Esq., B.A., Rossall School, Fleetwood ; and

John Thos. Seccombe, Esq., M.D., King's Lynn,

were balloted for and duly elected Fellows of the Society.

The New Savilian Observatory for Astronomical Physics at Oxford.

The establishment of an Observatory for Astronomical Physics in one of our most ancient seats of learning, cannot fail to be a matter of great interest to the Members of the Royal Astronomical Society. Under this impression it is proposed to give some account of the circumstances which ultimately led to the undertaking, and of some of the objects which it is hoped will be realized thereby.

The Savilian Professor of Astronomy in Oxford, shortly after his appointment, conceived it to be his duty to lay before the proper authorities in the University, the importance of being furnished with instrumental means adequate to the instruction of his class, and for the purposes of original research. The formal application was made to Convocation in March of the present year ; when the University, with great, but by no means unusual liberality, voted a sum of money sufficient for the purchase of a Refracting Telescope of 12 $\frac{1}{4}$ -inches aperture, and for providing a suitable building to contain it. It was contemplated

D

that this great telescope should be furnished with every appliance which experience had proved to be conducive to the requirements of modern research, and to the saving of physical labour in the use of the instrument. These conditions Mr. Grubb of Dublin has undertaken to fulfil in the terms of his contract with the University; and, judging from what that artist has already performed, no doubt need be entertained that all proper expectations will be realized.

Within the official lifetime of the present Astronomer Royal, an aperture of even* five inches for a refracting telescope, was a circumstance of extreme rareness, if not utterly unknown; such, however, has been the advance both in the manufacture of optical glass, and in the construction of telescopes, that no delay or difficulties were apprehended in procuring an instrument of the comparatively large dimensions referred to.

The Professor and those with whom he acted felt, at the time, that by the acquisition of this noble instrument, at all events the foundation was laid for eventual astronomical arrangements in the University of a far more extensive nature, but they resolved to wait patiently for some suitable, though it might be distant, opportunity for again pressing the claims of this particular branch of science. Had this been all that had transpired relating to the progress of Astronomy in Oxford, probably it would not have been thought desirable to trouble the Royal Astronomical Society with any formal account beyond a brief and passing notice of the liberal provision which the University had thus made for the scientific advantage of its students.

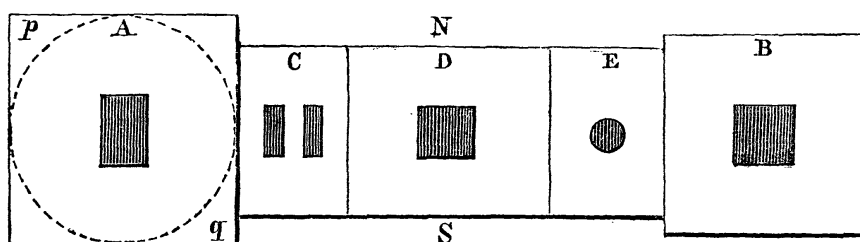
Very shortly, however, after the above arrangements had been completed, Dr. Warren De La Rue, on hearing of the generous disposition of Oxford towards a science which had so successfully occupied a large portion of his life, offered to present the University with his far-famed Reflecting Telescope and the greater part of the contents of his Observatory, on the sole condition that they should be usefully employed. Unfortunately, it was the failure of his eyesight which was the proximate cause of our late President's desire thus to transfer his instruments from Cranford to Oxford: fortunately, this transfer could not be effected before their owner had made, through many years, the noblest use of instruments, which, as he says, "were constructed from his own drawings, and by the hands of his own engineers." There was also a certain gracefulness in thus offering to Oxford a magnificent telescope, for the scientific application of which, the University had recently conferred upon him the high distinction of an Honorary Doctor's degree.

Here, then, there seemed to be presented a fitting opportunity for at once establishing at Oxford a complete Observatory for

* There is a very interesting account of the difficulties which up to 1826 beset the construction of object-glasses beyond the aperture of four inches, in the *Memoirs* of the Royal Astronomical Society, vol. 2, page 507.

the new science of Astronomical Physics, which, under other circumstances, might not have been realised for years. A Committee of Scientific Professors was appointed for the consideration of the subject; and after much and most careful consultation, they recommended the University to accept the munificent gift, and to provide the pecuniary means both for housing the instruments, and for skilled assistance for the Professor in the use of them. The University, acting in the same spirit of liberality which has for many years characterised their dealings towards science, and notwithstanding their grant of £2,500 in March, again added in the month of November a still further sum, adequate for the purposes described.

The annexed diagram, though not intended to represent the architectural features of the building, will sufficiently well explain its general plan.



At A is a square tower, with rustic abutments at the angles, each side being 21 ft. 6 in. clear, inside. It consists of three floors. First, a basement floor, 3 ft. 6 in. below the level of the ground, and 9 ft. 6 in. high. There are windows north and south. Above this is a Computing Room, 12 ft. high. Thirdly, this is surmounted by the Equatoreal Room, destined to contain the great Refracting Telescope, now in course of construction by Mr. Grubb. The walls of this room are 8 ft. 6 in. high from the floor to the bottom of the shutter, and then comes the Revolving Dome, to be described hereafter.

The spaces *p* and *q* between the square walls of the Tower, and the cylindrical skirting of the Equatoreal Room, furnish convenient balconies for the observations of shooting stars and other phenomena in the open air. These balconies are approached from the Equatoreal Room through glazed doors, which will furnish sufficient light in the daytime. The pier for the telescope is built on a foundation of concrete, 9 ft. long, 7 ft. wide, 4 ft. 6 in. deep, and tapers off to 4 ft. 6 in. by 3 ft. This Tower will probably be designated the Savilian Tower. C, D, E, represent a corridor about 40 ft. long and 13 ft. wide. This corridor is to contain two instruments which have already been in use for the instruction of the Astronomical Class in the University. First, there is a basement floor, uninterrupted by divisions, and, similar to that of the Savilian Tower, 9 ft. 6 in. high. Above this is the floor for the instruments, on a level with the floor of the computing room of A. C will contain a Transit

Instrument, the aperture of which is 4 in., and focal length 5 ft. ; of course there is also its clock. E will contain an Altazimuth Instrument, by Troughton and Simms, with 18-in. circles ; it will be fixed in the meridian, and serve as a Transit Circle, for the instruction of the students. Each of the rooms C and E is 10 ft. long, 12 ft. high. D is a room 18 ft. long, and is intended to contain one of Dr. De La Rue's reflecting telescopes mounted in Altazimuth fashion : aperture 13 in., focal length 10 ft. This instrument will command about one hour on each side of the meridian, and uninterrupted sweeps from the North and South horizon to the zenith. It will be applied chiefly to Zone work ; and inasmuch as its optical capacities are of the highest class, it will occasionally serve for the students, in the scrutiny of celestial objects. B is a tower similar in all respects to the Savilian Tower, except that the side of the square is 18 ft. 6 in., and the height of the walls of the Equatoreal Room is 3 ft. 6 in. instead of 8 ft. 6 in. The dome is similar to that of A. It is proposed to call this Tower the De La Rue Tower. In the basement will be placed Dr. De La Rue's polishing machine for large mirrors ; it is sufficiently large for the construction of a mirror of 2-ft. aperture, and in due time will probably be set in requisition for the completion of mirrors of those dimensions, but of an unusually short focal length, perhaps 10 ft. There also will be placed, Foucault's apparatus for testing the qualities of mirrors and object-glasses. The basement also permits the admission of a beam of sunlight, nearly 80 ft. long ; at a window on the east or west side may be placed a Heliostat, on a small stone balcony provided for the purpose. Most of the windows throughout the building are furnished with similar stone balconies, on which instruments may be placed. The first floor of the De La Rue Tower is subdivided into a small room for Photography and a room for the Professor. The Revolving Domes are peculiar in their construction. Inasmuch as by the great liberality of the University, permission has been given to place this Observatory in the most convenient position within their beautiful Park,* it was thought proper to consider the architectural character of the building, at any rate to the small extent permitted by the astro-

* The ground for this Park, consisting of about sixty acres, was purchased and laid out by the University, and then, with admirable liberality, thrown open to the public. The situation of the new Observatory is remarkably fortunate, and free from any injurious obstruction to the view in every direction. Nevertheless, it lies within an easy distance from and communicates with the University Museum, where are to be found the Lecture Rooms and Laboratories of the various scientific Professors. This Museum, again, is another instance of the munificence of the University, in providing at vast cost for the wants of her students in the natural sciences. Should the University see fit to assign, as is proposed, a portion of the Park contiguous to the new Observatory for the purposes of a Botanic Garden, then, this remarkable aggregation of appliances for every branch of Natural Philosophy, round a common centre, will form an arrangement, which for compactness and completeness has no present rival in the world : a monument and a pledge of the generous care of a true Alma Mater.

nomical exigencies of the case. With this view the form of a lofty, truncated Dome was selected for the revolving roofs, rather than the usual and convenient form of a drum. This necessitated difficult and unusual contrivances for the shutters. They are formed of revolving corrugated steel, extending from the bottom of the dome to about 2 ft. beyond the zenith. The domes revolve on a modification of a Smeaton's live-ring, consisting of twelve wheels. The framework of the dome is of light wrought-iron ribs, braced together with a lattice-work of strong wire; on this lattice-work strong canvas is quilted, and this is again covered with layers of felt and sail-cloth painted. External ribs will run down the roof from top to bottom. The domes are moved from the inside, by means of a large wheel having an India-rubber tire, pressed down on the kerb with any suitable pressure by means of a graduated spring, and turned round by an endless cord. There is also a special contrivance for keeping out the wind. The horizontal truncated top of the dome is surrounded by a light ornamental cresting or balustrade to conceal the box which contains the revolving steel shutters. The opening of the shutters is 3 ft. 6 in. wide.

It is part of the plan, that a Board of Visitors should be appointed for this Observatory, and their Report is annually to be laid before Convocation. This annual Report will, no doubt, find its way into the great Commonwealth of Science, and thus tend to awaken fresh sympathies, and to enhance the general respect for the University far beyond the precincts of Oxford.

No reference has, so far, been made to the Radcliffe Observatory, which has long occupied so eminent a position in the Astronomical Republic. The impression generally prevails that this Observatory is connected with and is under the control of the University of Oxford. Such, however, is not practically the case. The Radcliffe Observatory was founded, exactly a century ago, by the Trustees of the Radcliffe estates, who are not necessarily officers of the University. It originated at the instance of the Savilian Professor of Astronomy of that day, who failing to obtain astronomical instruments from the University, successfully applied for that purpose to the Radcliffe Trustees. The result of that wise and liberal disposition of their funds has been the establishment of an Observatory, which under its last two directors, Mr. Johnson and the Rev. R. Main, has, after Greenwich, proved itself to be second to none for the accuracy and value of its observations. The Savilian Professors are, by the Statutes of the University, no longer permitted to hold the office of Director of the Radcliffe Observatory. It is probable that the Radcliffe Observatory may continue in its sphere of usefulness within the limits of the old astronomy, while the new Observatory will strictly confine itself to the more recent branches of Astronomical Physics. Each may thus assist and illustrate the other. Without the hearty co-operation of Mr. Main, and indeed without the loyal and intelligent zeal, and unanimity of the other scientific

54 Mr. Birmingham, *On Stars in Schjellerup's Catalogue.* XXXIV. 2,
Professors, the establishment of the new Savilian Observatory
would have been an impossibility in Oxford.*

C. PRITCHARD,
Savilian Professor of Astronomy.

Oxford, 1873, December.

* An Astronomical Library will be a necessity for the complete equipment
of this new institution. The Professor will gratefully accept and acknowledge
assistance therein from the various Observatories and learned Academies of
Europe and America.

*On the probable Variability of some of the Red Stars in Schjellerup's
List, published in the Astronomische Nachrichten, No. 1591.*
By J. Birmingham, Esq.

(Communicated by the Rev. T. W. Webb.)

I find that the magnitudes of several stars in the above list
now differ considerably from the magnitudes recorded, while, at
least one star—No. 252—seems to have quite disappeared.

This star was twice observed by Sir John Herschel, and noted,
in the Appendix to the *Cape Observations*, as “extremely intense
ruby” and of the 8.5 magnitude. It does not appear, however,
in the *Bonn Catalogue*.

My first search for it was in July 1872, when I failed to see
it, and I was equally unsuccessful in several searches up to a
recent date. In October of the present year (1873) I wrote to
the Rev. Mr. Webb requesting him to look for it; but to him, and
also to Mr. Lynn and other observers at the Royal Observatory,
Greenwich, it was invisible. We are, therefore, presented with
two hypotheses: either the star must be a variable, or Herschel
committed a mistake in his observations. It may be remarked
that there is a star near the place of 252, well agreeing with
Herschel's description of the latter. The former is No. 251. It
was observed by Bessel as red, and rated by him of the 8th magni-
tude. The positions of both for 1872 are as follows:—

			R. A.			Decl.		
			h	m	s	°	'	"
251 . . .	21	37	59	;	+	37	25	50
252 . . .	21	39	4	;	+	37	16	38

showing a difference of over 1 minute in R.A. and 9' in decl.
The grounds, therefore, for any suspicion of a mistake on the
part of Herschel might be said to be, the proximity of the places
of the two recorded stars, with their similarity of appearance as
described, and the absence of 252 from the *Bonn Catalogue*.
I am not aware whether the red stars in the Appendix to the
Cape Observations are to be considered as discoveries of Sir John